

EPIDEMIOLOGICAL CHARACTERISTICS OF INJURIES IN YOUNG ADULTS FROM ISTRIA COUNTY

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Summary

Injuries are among the most common causes of hospitalization, causing 10% of the total mortality in the world and are the cause of disability and professional and general inability to work. The aim of this study was to determine the epidemiological characteristics of injuries of young adults in the area of Istria County, treated for injuries in the General Hospital Pula, and to examine the connection of the recorded injuries with sociodemographic and socioeconomic indicators of the injured patients and their lifestyle habits. This cross-sectional study was conducted in April and May 2017 using a specially designed questionnaire. Out of 202 subjects 131 (64.9%) were men, the average age of all subjects was 28.8 years (19-39), and 150 (74.3%) of the subjects were employed. Women were statistically significantly more often injured as a result of fall, slippage or tripping (43.7%, $p=0.010$), while men were statistically significantly more often injured when using different tools and during excessive physical activity (44.3%, $p=0.003$). People of average economic status were more often injured than people with better economic status, both, at home (32.0%, $p=0.049$) and at work (27.0%, $p=0.004$). People of better economic status were more often injured on the roads (29.0%, $p=0.010$), in nature and recreation grounds (39.0%, $p=0.030$). Gender and socioeconomic status significantly affect the frequency of injury and the method of injury.

Keywords: injury, young adults, questionnaire study, prevention, Croatia

Introduction

Injury is a physical damage caused by the immediate and sudden exposure of the human body to various types of energy (mechanical, chemical and physical) or may be due to the lack of essential vital elements (air, water, heat) such as drowning, choking or freezing (Brkić Biloš, 2014). It is estimated that 5.8 million lives are lost worldwide due to traumatic injuries each year, which is more than 10% of the world's deaths (World Health Organization, 2010). Trauma is still one of the greatest global public health challenges of our time, contributing to millions of deaths and injuring more than 100 million individuals each year (Zuraik, 2017).

The largest share in mortality is in the population of 15 to 45 years, which is the most productive, and thus greatly affects the functioning of both an individual and society as a whole (Bashah, 2015). Trauma is very heterogeneous in terms of its underlying causes, the types of injuries and their severity, and is characterized by considerable prognostic uncertainty. Its risk factors are related to human behavior and to sociosanitary, occupational, economic, political and cultural variables and its management in turn depends on a broad range of structures, organizations and clinical and surgical specialties (Baker, 1987). In the European Union in 2010, the death rate associated with the consequences of the accident was as high as

33%, therefore, prevention of injuries is one of the biggest challenges for the World Health Organization (Preden, 2004). Injury-related morbidity and mortality is a big public health burden in the United States (US) as well. Unintentional traumatic injuries killed 136,053 people in the US in 2014, surpassed only by heart disease (614,348), cancer (591,699), and chronic lower respiratory diseases (147,101) and it extends beyond mortality. IDB (Injure Data Base) is a system that has been developing intensively in recent years, and is made up of a number of projects funded by the European Commission in the EU countries. Following the obtained data, trauma systems have been developed in order to prevent and improve the treatment and rehabilitation of individual countries (Brkić Biloš, 2014). In 2013, the total cost of traumatic injuries in the US (including lost wages and medical expenses) was estimated at \$671 billion, with non-fatal injuries comprising 68% of the cost (DiMaggio, 2017). In Australia, injuries are responsible for 7% of the total burden of disease and injury, equating to over 185 050 years of healthy life lost due to premature death or disability (Begg, 2007). In 2012, injuries were ranked third in the total mortality rate of the population in Croatia. Like elsewhere in the world men had higher mortality from the injury. The importance of injury as a public health problem is manifested in the fact that they are primary cause of the deaths of young people up to

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39 years, which significantly affects the demographic picture of the society (Brkić Biloš, 2014).

The aim of this study was to determine the epidemiological characteristics of injuries of young adults in the area of Istria County, treated for injuries in the General Hospital Pula, and to examine the connection of the recorded injuries with sociodemographic and socioeconomic indicators of the injured patients and their lifestyle habits.

Participants and Methods

This cross-sectional study was conducted during April and May 2017 at the Unified Emergency Hospital Admissions Department of the General Hospital Pula. The patients were all between 18 and 39 years of age from the County of Istria and were injured during this period and admitted at the Department. In total 202 patients volunteered to participate in this study after signing the informed consent for participation. A specially designed questionnaire was used to conduct the study. The questionnaire consisted of sociodemographic and socioeconomic questions, questions related to the characteristic of the injured person, and the circumstances of injury occurrence. The normality of data distribution was tested with the Kolmogorov-Smirnov test. The mean values of the continuous variables were expressed by the arithmetic mean and the standard deviation for the normally distributed variables. Nominal variables were presented by distribution of frequency by groups

and by share. The χ^2 -test was used to determine the difference between the two independent samples. On all statistical analyses, two-sided p-values of 0.05 were considered significant. All collected data were processed using the statistical package MedCalc 14.12.0 (MedCalc Software, Ostend, Belgium).

Results and Discussion

Since this was the first research of this kind that was carried out at the General Hospital Pula, there was no adequate data for comparison. The study included 202 injured patients in total, 65.0% males and 35.0% females, which is consistent with previously known Croatian and world data regarding the frequency of injuries according to the gender (Brkić Biloš, 2014). This is similar with other researches where most of the patients are young adult males such as the research from Abu Dhabi where 72.4% were male patients (Rahman, 2016) and the one from United States of America (USA) where 53.4% of patients were male (DiMaggio, 2017). There was a statistically significant difference between men and women in the circumstances of injury ($p=0.002$). Namely, women were most often injured due to falling, slipping or stumbling, while men were more often injured in contact with stationery objects, by handling the tools and overexerting during physical activity (Table 1). This result could indicate that there is still a big difference in jobs and activities between men and women given their physical capabilities.

Table 1. Patients according to the circumstances of the injury and gender

Circumstance of the injury	Number of patients (%)		Total	p*
	Men	Women		
Because of other persons or animals behavior and during transport	35 (26.7 %)	26 (36.6 %)	61 (30.2 %)	0.002
Because of falling, slipping or stumbling	38 (29.0 %)	31 (43.7 %)	69 (34.2 %)	
Because of contact with stationery objects, by handling the tools and overexerting during physical activity	58 (44.3 %)	14 (19.7 %)	72 (35.6 %)	
Total	131 (100 %)	71 (100 %)	202 (100 %)	

* χ^2 -test

Since City of Pula is a coastal city, as the tourist season approaches, the number of injured patients was increasing from April to May, as can be seen from the data showing the month of injury. Namely, the start of the tourist season brings increased activity in the preparation for the summer, which leads to more work, greater exertion, and thus more injuries (Table 2).

Most of the injured by their own estimates were of

average economic status and have completed high school, with the statistically significant difference seen only in the location at which the injury was acquired between people of average economic status and people of above average economic status ($p=0.002$).

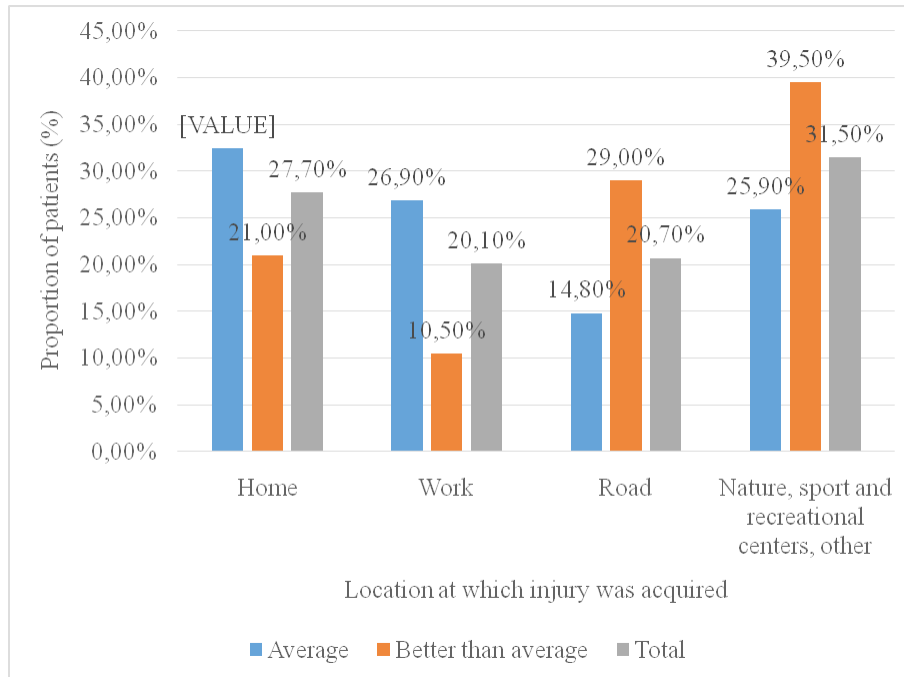


Fig 1. Patients according to the location at which injury was acquired and their economic status

This may be related to the fact that a better economic status usually means better business, more financial resources for travel and thus risk on the roads, while the average economic status suggests that people are

staying at home more and are doing more difficult jobs and thus increasing the possibility of injury in those places (Fig. 1).

Table 2. Patients according to the anatomical location of injury and month in which injury occurred

Injury location	Number of patients (%)		Total	p*
	April 2017	May 2017		
Head and neck	18 (24.7 %)	25 (19.4 %)	43 (21.3 %)	0.120
Chest, abdomen, lower back, pelvis, injuries to several parts of the body	8 (11.0 %)	27 (20.9 %)	35 (17.3 %)	
Shoulder, and upper arm, the elbow and the forearm, the wrist and the hand	19 (26.0 %)	42 (32.6 %)	61 (30.2 %)	
Hips and thighs, knees and lower leg, ankle and foot	28 (38.3 %)	35 (27.1 %)	63 (31.2 %)	
Total	73 (100 %)	129 (100 %)	202 (100 %)	

* χ^2 -test

There was a statistically significant difference between the location at which the injury was acquired, depending on the time of the injury ($p=0.013$) (Fig. 2). This was to be expected because afternoon and evening hours are mostly reserved for sports activities, walks and socializing with friends. Regarding the location at which the injury occurred most of them happened in nature, sport and recreational centres and other (30.2%), followed by home (29.2%), road (20.8%) and lastly work (19.8%). This is similar to other studies where most of the injuries occurred at home or at work with 62.0% and 16.7%, respectively (Rahman, 2016). In the USA study there was a decline

in the injuries caused by motor vehicles and other modes of transportation from 2009 to 2012 by 3.5% (DiMaggio, 2017). Most of the patients in this study, (53.0 %) were between 29 and 39 years of age, while 47.0% were between 18 and 28 years of age. This result is different from a similar study in Australia, where largest number of patients were aged from 16-24 years, and most of the patients, 45.5% were injured on the road (Ogilvie, 2014). On the other hand, study in Abu Dhabi had 35.7% of patients between ages 25 and 44 (Rahman, 2016). In a six-year long research in USA mean age of injured patients was between 33.8 and 35.3 years (DiMaggio, 2017). This can be

explained by the fact that most of the patients in this study as well as in the one from Abu Dhabi had mild injuries since the patients with most severe injuries could not be included in this study, and patients in the Australian study were those with major trauma. Regarding the severity of injury, 80.2% of patients in

this study had mild injury while 19.8% of them had moderate injury which is similar to the Abu Dhabi study where 69.0% had injuries that were light, 22.0% moderate and just 1.3% were serious or fatal (Rahman, 2016).

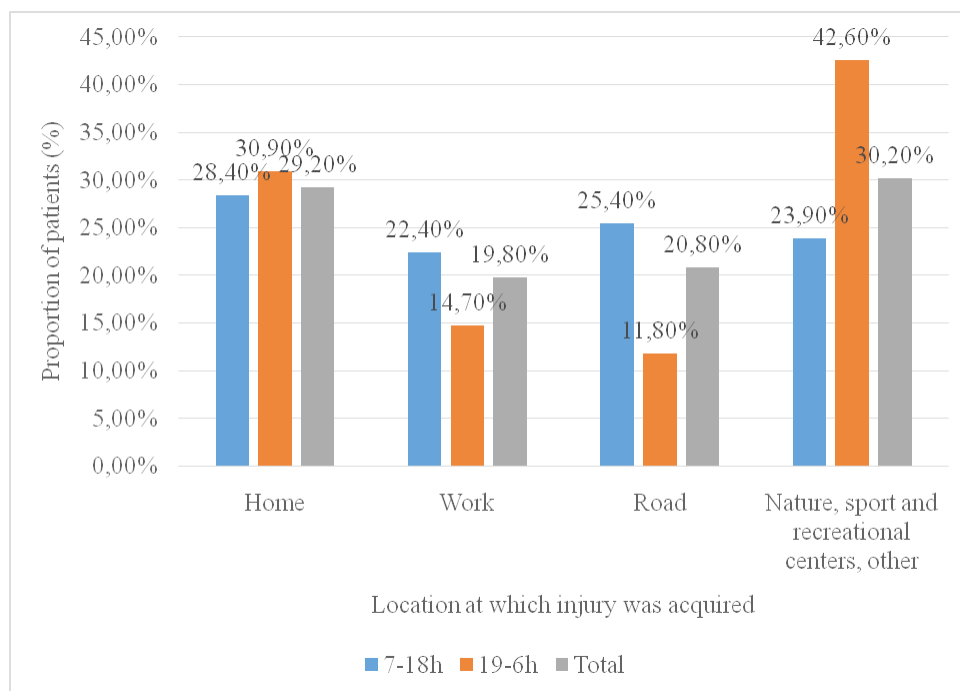


Fig. 2. Patients according to the location at which injury was acquired and time at which the injury was acquired

According to the results of this study, a very small number of subjects were affected by alcohol, drugs and energy drinks, which according to their physical condition at the time of the review evidently did not correspond to the truth, but since there was no available mechanism that we could use to verify the truth of the data, and the study itself does not foresee, the data are interpreted according to what the subjects have written in their answers to questionnaires. According to the study conducted among the students at the University of Osijek, there is a clear correlation between alcohol consumption and injury, whereby the higher the amount of alcohol consumed, the greater the likelihood of injury (Miškulin, 2015).

The limitations of this study were a short follow-up period of two months since it is expected that the incidence of injuries and their type changes during the calendar year, mainly due to the tourist season or the summer period. The patients with most severe injuries were unable to complete questionnaires and sign an informed consent to participate in this study because of the severity of their injuries and could not be included in the study. One part of the injured

patients from Istria County seeks medical assistance at Clinical Hospital Centre Rijeka, therefore the results didn't include all of the patients in Istria County during study period.

Conclusion

Like in the rest of the world injuries present a significant public health problem in the population of young adults aged 18 to 39 in the area of Istria County. Gender and socioeconomic status significantly affect the frequency of injury and the way of injury. There is a difference in the way men and women acquire an injury. While men are more often injured in contact with objects that are left behind, by handling tools and overexertion during physical activity, women are affected by falling, stumbling or slipping. People of better economic status are more often injured on the roads, during sport and recreational activities and in nature, while people of average economic status are more often injured at home. Housing, education, marital status, alcohol, drug and energy drinks, do not affect the location of the injury while the working status

affects the injury site. Conducting epidemiological research, preventive programs, and raising awareness of individuals about personal responsibility are key to reducing mortality and disability rates due to injuries and reducing injuries in general. Because injury is not something that has to happen, this is something that can be prevented if there is investment into programs that raise awareness of behaviour, which will lead to raising the level of personal security and thus the security of the society in whole.

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EPIDEMIOLOŠKE KARAKTERISTIKE OZLJEDA MLADIH ODRASLIH OSOBA S PODRUČJA ISTARSKE ŽUPANIJE

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Ozljeđe se nalaze među najčešćim uzrocima hospitalizacije, a uzrokuju 10% ukupnog mortaliteta u svijetu i uzrok su invaliditeta i profesionalne i opće nesposobnosti za rad. Cilj ovog istraživanja bio je utvrditi epidemiološka obilježja ozljeda mladih odraslih osoba s područja Istarske županije zbrinjavanih zbog ozljeda u Općoj bolnici Pula te ispitati povezanost zabilježenih ozljeda sa sociodemografskim i socioekonomskim pokazateljima ozlijeđenih te njihovim životnim navikama. Ovo presječno istraživanje provedeno je tijekom travnja i svibnja 2017. pomoću anketnog upitnika. Od 202 ispitanika 131 (64,85%) je bio muškarac, prosječna dob ispitanika iznosila je 28,8 godina (19-39). Zaposleno je 150 (74,3%) ispitanika. Žene se statistički značajno češće ozljeđuju uslijed pada, poskliznuća ili spoticanja (43,7%, p=0,010), dok se muškarci statistički značajno češće ozljeđuju pri rukovanju različitim alatima te uslijed prenaprezanja tijekom fizičke aktivnosti (44,3%, p=0,003). Osobe prosječnog ekonomskog statusa češće se ozljeđuju od osoba boljeg ekonomskog statusa kod kuće (32%, p=0,049) i na poslu (27%, p=0,004). Osobe boljeg ekonomskog statusa češće se ozljeđuju na prometnicama (29%, p=0,010), u prirodi i terenima za rekreaciju (39%, p=0,030). Spol i socioekonomski status značajno utječu na učestalost ozljeđivanja i način ozljeđivanja.

Ključne riječi: ozljeda, mladi odrasli, anketno ispitivanje, prevencija, Hrvatska